

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2018/2019

EME3186 - ERGONOMICS AND HUMAN FACTORS
(ME)

31 MAY 2019
9.00 A.M. – 11.00 A.M.
(2 Hours)

INSTRUCTION TO STUDENTS

1. This Question paper consists of 7 (SEVEN) pages including the cover page.
 2. There are 4 (FOUR) Questions in this Exam paper. Attempt ALL questions.
 3. All questions carry equal marks and the distribution of marks for each question is given in the question paper.
 4. Write all your answers in the Answer Booklet provided
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QUESTION 1

- a) **Figure Q1(a)** shows the front view of a poor ergonomic design car dashboard. Propose **FOUR** design problems and address them by re-designing the dashboard. Make sure that you explain the reasons for what you have done in re-designing the dashboard. [8 marks]

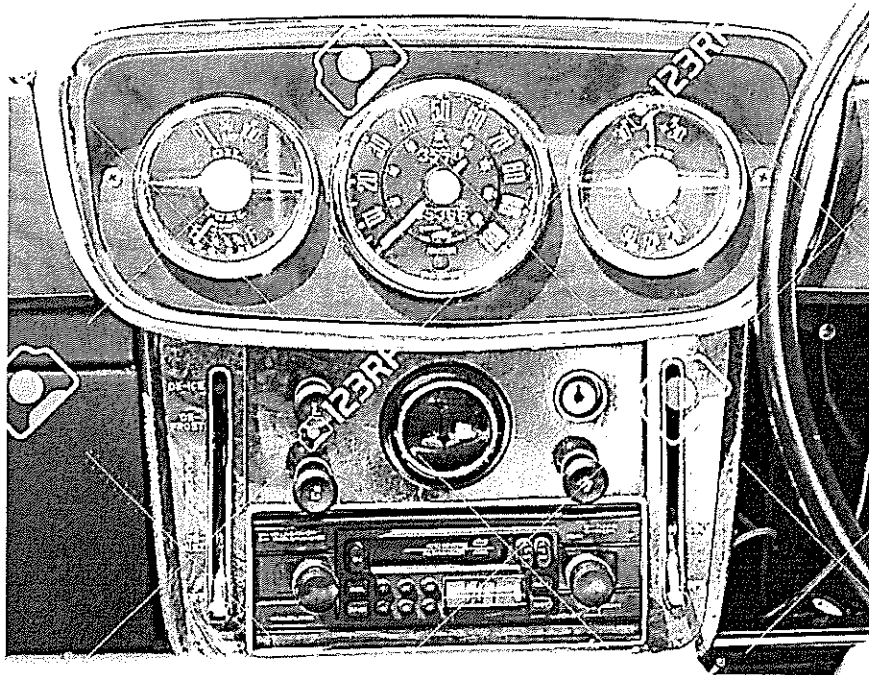
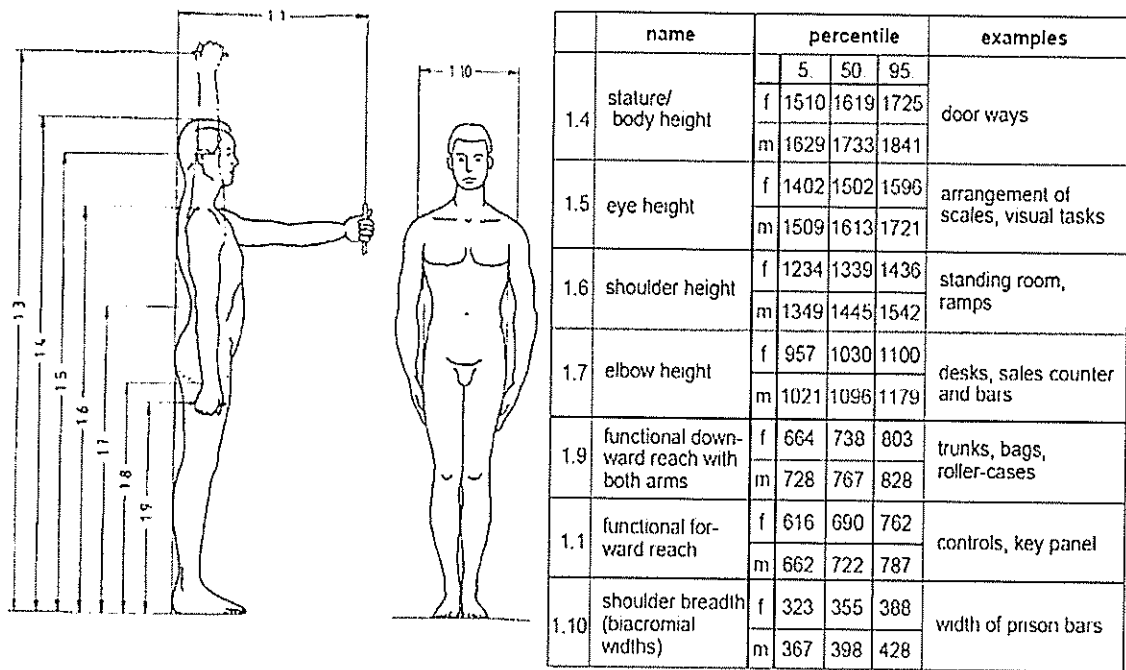


Figure Q1(a)

- b) **Figure Q1(b)** shows statistical information on human reaches for the different percentile. By means of a neat sketch, correct dimensions and labelling, answer the following:
- i) Height of the door way assuming majority of the door users are women from Asia [3 marks]
 - ii) Height of the kitchen table top assuming majority of the users are from the 95th percentile. (Justify your answer on the selection of EITHER male or female.) [3 marks]
 - iii) Width of a female prison bar assuming the prison is designed for the 5th percentile cluster. [3 marks]
 - iv) Height of the projector assuming the average age of the male user is 70 years of age. [1 marks]

Continued...



average of 16 to 60 years of age
(Note: All dimensions given are in mm)

(DIN 33402, Part 2)

Figure Q1(b)

- c) Propose the 'comfortable viewing angle' of the human eyesight.
(Note: You may support your answer with a neat sketch and correct labelling)

[7 marks]

Continued...

QUESTION 2

- a) **Figure Q2(a)** shows the postural positions of an individual using an Oscillating Vibrating Machine (OVM). In the light of your ergonomic knowledge on Whole-Body Vibration (WBV), evaluate **SIX** implications if a child is subjected to the OVM.
(Note: Assume child is 10 years old. You may support your evaluation by means of neat sketches and correct labelling)

[12 marks]

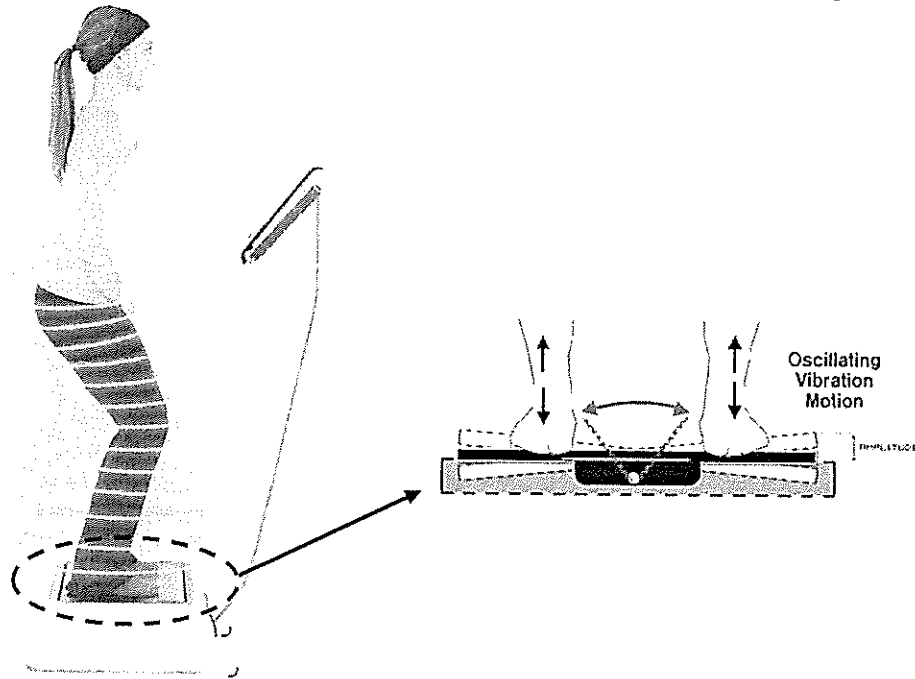


Figure Q2(a)

- b) How would you assess the key components that leads to overall job satisfaction of a group of employees working in an industry?
(Note: You may support your answer with neat sketches and correct labelling)
- c) In your recent consultation site visit to Pipe Power Sdn. Bhd, you noticed that the sound level generated during the testing of hydro piping works was 120dB. In your own words, state your concluding remarks in your detailed report on the possible safety key measure to be taken by the top management.

[10 marks]

[3 marks]

Continued...

QUESTION 3

- a) Design an ergonomic workstation that incorporates '*neutral postures*'. You may assume the person is sitting while using the computer to carry out a specific task.
[10 marks]
- b) One of the main challenges automakers face in the automotive industry is on the ergonomic design for foot operations. Using your ergonomic knowledge, design an ergonomic pedal accelerator of a car. Propose **FIVE** ergonomic design features of your ergonomic pedal accelerator.
[12 marks]
- c) Construct a diagram with correct labelling showing the main elements of '*fitting a person to a job vs. fitting the job to a person*'.
[3 marks]

Continued...

QUESTION 4

- a) By means of a neat sketch and correct labelling, differentiate the different methods available under the '*Classical Measuring Technique*'.

[12 marks]

- b) **Figure Q4(b)** shows an operator performing a task in an un-ergonomic manner. Using the '*Compatibility Principles*' in ergonomic design, state **FOUR** design changes that can be improved.

(Note: Neatly sketch your design along with the selected compatibility principles with correct labelling)

[8 marks]

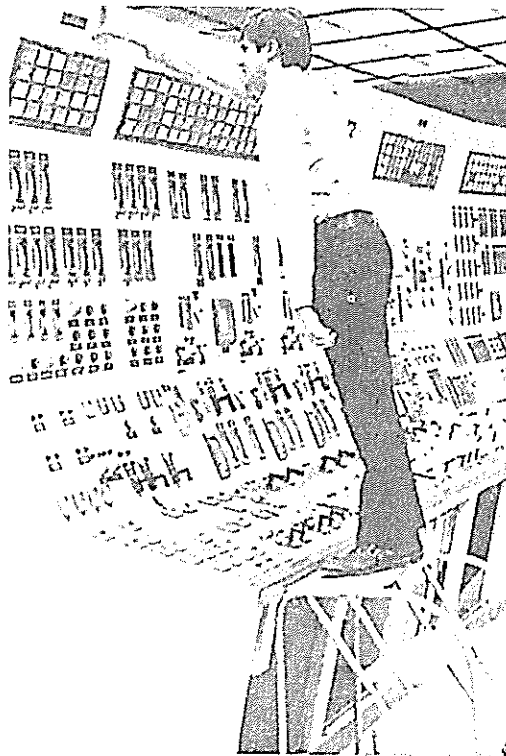


Figure Q4(b)

Continued...

- c) Based on **Figure Q4(c)**, state the preferred location and height of the safety barrier between the operator and the danger zone. What will be the suitable posture of the operator if he intends to reach the danger zone by means of his hands?
(Note: You are required to redraw *Figure Q4(c)*, together with the correct placement of the safety barrier and the operators new posture when dealing with the danger zone.)

[5 marks]

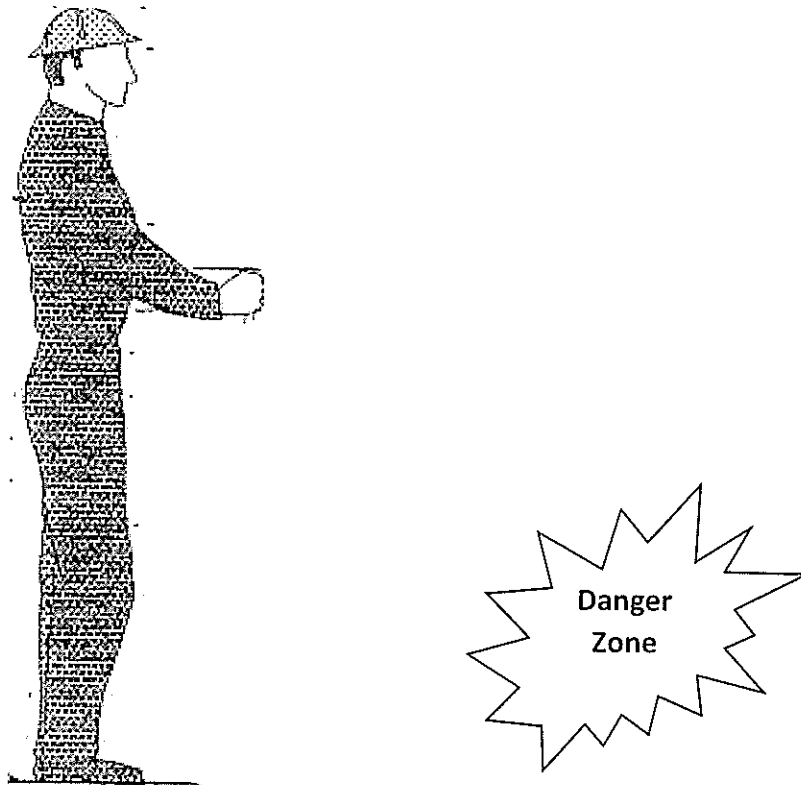


Figure Q4(c)

End of Paper